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Ecology at Defense-Related Uranium Mines

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8.2 Environmental and Human Health Risk Screening of
Abandoned Mines

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Spiny star cactus



Longnose leopard lizard

Defense-Related Uranium Mines (DRUM)

- DRUM Program created to:
 - Investigate abandoned uranium mines that sold ore to the Atomic Energy Commission circa 1947–1970
 - Evaluate potential risks to humans and the environment
 - Perform Verification and Validation (V&V) activities at the mines
- V&V for the program began during the 2017 field season and included ecological work



Ecological Field Data Collected for DRUM

- Ecological units (distinct vegetation communities) on:
 - A mine site's waste rock piles
 - Other locations within a mine's disturbed area (e.g., depressions, drainages)
 - Areas surrounding the mine site



Desert shrub



Pinyon-juniper



Mixed conifer

Ecological Field Data Collected (continued)

- Species present at mine sites:
 - Plant species (dominant, secondary, rare)
 - Wildlife
 - Noxious weeds
 - Special-status species



What DRUM Ecologists Look For



- Observations



- Sounds



- Burrows



- Nests

- Scat



- Tracks

Special-Status Species

- Federally listed as threatened or endangered
- Birds of Conservation Concern
- State-listed species
- Tribe-listed species
- Bureau of Land Management sensitive species
- U.S. Forest Service sensitive species



Special-Status Species (continued)



Golden eagle



Smith's buckwheat



San Rafael milkvetch



Midget faded rattlesnake

Risk Scoring

- Physical hazards to wildlife
 - Open shafts
 - Open drill holes
 - Entanglement hazards
- Other relevant information (e.g., nearby wetlands or surface water that may draw wildlife to the area)



Risk Scoring (continued)

- Risks and pathways are presented to land management agencies to aid in prioritization and decision-making
- Primary hazards are related to human health
- Ecological hazards are modifying factors to the primary hazards
- Two types of ecological hazards:
 - Physical hazards to wildlife
 - Potential risk pathways (presence or absence)
 - Contaminant migration
 - Mine-related contamination, as evidenced by elevated gamma, is present outside the disturbed area, especially in a surface water feature
 - Potential for bioaccumulation
 - Contamination is potentially present on a waste rock pile and it supports vegetation attractive to wildlife



Uses for DRUM Ecological Data

- Reporting to partner agencies
 - Risk-scoring information reported to agencies
 - Special-status species
 - DRUM ecologists are in good position to find special-status species because of wide areas visited
 - Locations are recorded in GPS; species are photographed
 - Federally listed species are reported to U.S. Fish and Wildlife Service
 - All special-status species included in mine reports
 - Ecological data are stored in DRUM database for future use



Uses for DRUM Ecological Data (continued)

- DRUM herbarium
 - Ecologists collect plant samples for herbarium
 - Aids in species identification for future verification & validation work
 - Becomes part of the federal record for DRUM; useful for future research



Uses for DRUM Ecological Data (continued)

- Value of Ecological Surveys
 - Descriptions of plant species and communities in variety of altered habitats
 - Comparison of mine sites with surrounding areas
 - Long-term changes in vegetation communities disturbed by historic mining
 - Documents how mine disturbed areas are recovering
 - Mine land reclamation
 - Potential vegetation of waste rock piles
 - Observations of current impacts by wildlife, livestock, and recreational users



Questions?

